

## **REMARKS**

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Non-elected claims 1-35 are requested to be cancelled without prejudice or disclaimer. Claims 41-43 are cancelled and claims 36 and 44 are amended. Specifically, claim 36 is amended by incorporating the limitations from original claim 43.

New Claims 49-73 are being added. Independent claims 49 and 62 are based on allowable original dependent claims 44 and 48. Dependent claims 50-61 and 63-73 are based on original claims 37-48 and 37-47, respectively. No new matter was added. After amending the claims as set forth above, claims 36-40 and 44-73 are now pending in this application.

### **I. Allowable Subject Matter**

Applicants appreciate that claims 44 and 48 would be allowed if rewritten in independent form and if the indefiniteness rejection is overcome. In response, independent claims 49 and 62 have been added. Claim 49 recites the limitations of original claim 36 and the limitation that “the negative electrode comprises at least one of Ni, Cu, Fe or a combination thereof with an ionic conducting phase” from claim 44 that was found allowable. Claim 62 recites the limitations from original claims 36 and 48. Applicants respectfully submit that since the Office Action did not predicate the allowability of claims 44 and 48 on the intervening dependent claims, it is not necessary to include the limitations of intervening dependent claims in independent claims 49 and 62.

### **II. The § 112, ¶ 2 Rejection Should Be Withdrawn**

Claims 36-48 are rejected under § 112, ¶ 2 as being indefinite because the term “sufficient” is not sufficiently defined. This rejection is respectfully traversed.

The last paragraph of claim 36 recites that the term “sufficient reducing atmosphere” means an amount of reducing atmosphere which prevents the negative electrode from oxidizing. Thus, claim 36 itself provides a definition for the term “sufficient”. Furthermore, paragraph [0018] of the specification explicitly defines the term “sufficient” in a similar manner. Finally, paragraph [0040] provides a non-limiting example of a sufficient amount of reducing atmosphere which prevents oxidation of the negative electrode. Thus, one of ordinary skill in the art would understand the scope of the term “sufficient” from reading claim 36 and the corresponding portion of the specification.

### **III. The Prior Art Rejection Should Be Withdrawn**

#### **A. McElroy ‘859**

Claims 36, 39-43 and 45 have been rejected under § 102(e) as being anticipated by US 2004/0081859 (“McElroy ‘859”). This rejection is respectfully traversed.

The Office Action states that McElroy’s “negative electrode is made of strontium doped lanthanum.” Applicants respectfully submit that this is incorrect. The positive electrode of McElroy is made of strontium doped lanthanum manganite (LSM). Specifically, paragraph [0025] of McElroy states that the oxygen electrode 120 is made of LSM. The oxygen electrode in a solid oxide regenerative fuel cell is the positive electrode in both the fuel cell mode and the electrolysis mode. In contrast, the fuel electrode 110 is the negative electrode in both the fuel cell and electrolysis modes. Thus, McElroy ‘859 does not teach that the negative electrode is made of LSM.

The Office Action further states that with respect to claim 45, McElroy ‘859 teaches that the positive electrode is LSM and the negative electrode is a nickel-YSZ mixture. Applicants agree that the positive electrode of McElroy ‘859 is LSM, but disagree that the negative electrode in a solid oxide regenerative fuel cell is a Ni-YSZ mixture.

Paragraph [0026] of McElroy ‘859 specifically states that a Ni-YSZ negative (fuel) electrode 110 can only be used in a non-regenerative fuel cell which operates only in the fuel

cell mode. In contrast, paragraph [0026] of McElroy '859 specifically states that a Ni-YSZ negative electrode cannot be used in a regenerative fuel cell (i.e., a fuel cell which operates in both the fuel cell and electrolysis modes) because it would oxidize. Thus, the next to last sentence in paragraph [0026] of McElroy '859 states that a platinum containing negative electrode must be used in a regenerative fuel cell.

Claim 36 of the present application recites a regenerative fuel cell (i.e., a reversible fuel cell) which operates in both the fuel cell and electrolysis modes. Claim 36 recites that the negative electrode (i.e., the fuel electrode) of the regenerative fuel cell contains no noble metal or an unavoidable trace impurity amount of noble metal.

In contrast, McElroy '859 teaches that the Ni-YSZ negative electrode cannot be used in such a regenerative fuel cell and that a platinum containing negative electrode must be used instead. Since platinum is a noble metal, the negative electrode of McElroy '859 contains a non-trace amount of noble metal. McElroy '859 does not anticipate claim 36 because the negative electrode of McElroy '859 contains a non-trace amount of platinum.

#### **B. McElroy '595**

Claims 36-43, 46 and 47 have been rejected under § 102(e) as being anticipated by US 2004/0191595 ("McElroy '595") or under § 103(a) as being obvious over McElroy '595. This rejection is respectfully traversed.

McElroy '595 teaches a solid oxide regenerative fuel cell containing a fuel electrode 12 and an oxygen electrode 11 (Figure 1 and paragraphs [0031] and [0033]). Paragraph [0032] notes that the fuel electrode 12 is the negative electrode and the oxygen electrode 11 is the positive electrode. Figure 5 shows that for a SORFC system operating in the fuel cell mode, the fuel electrode 12 is the negative electrode and the oxygen electrode 11 is the positive electrode (denoted by the "-" and "+" signs near the fuel and oxygen electrode locations). Likewise, Figure 6 shows that for the same SORFC system operating in the electrolysis mode, the fuel electrode 12 is still the negative electrode and the oxygen electrode 11 is still the positive electrode.

The Office Action asserts that McElroy either anticipates or renders obvious claims 36-43, 46 and 47. Applicants respectfully disagree.

**1. McElroy '595 Is Not Available As Prior Art Under §103(a)**

Regarding the §103(a) obviousness rejection, McElroy '595 is not available as prior art under §103(a) because it is commonly assigned as the present application. Specifically, 35 U.S.C. §103(c) states that prior art references which are available as prior art only under §102(e), (f) or (g) and which are commonly assigned with the application being examined cannot be used as prior art under §103(a). In the present case, the present application and McElroy '595 are both assigned to the same assignee, Ion America Corporation, as of the date the present invention was made. McElroy '595 was published after the filing date of the present application. Furthermore, McElroy '595 is available under § 102(e) but not under §102(a) or (b) as prior art. Thus, McElroy '595 cannot be used in an obviousness rejection under §103(a).

**2. McElroy '595 Does Not Anticipate Claim 36**

Regarding the §102(e) anticipation rejection, McElroy '595 does not anticipate claim 36. Paragraph [0031] of McElroy '595 states that the negative fuel electrode is made of platinum or platinum family metals (i.e., other noble metals). Thus, the negative electrode must contain a sufficient amount of platinum or other noble metals to be electrically conductive in order to function as an electrode.

Claim 36 of the present application recites a regenerative fuel cell (i.e., a reversible fuel cell) which operates in both the fuel cell and electrolysis modes. Claim 36 recites that the negative electrode contains no noble metal or an unavoidable trace impurity amount of noble metal.

In contrast, paragraph [0031] of McElroy '595 teaches that negative electrode contains platinum or a platinum family metal. Since platinum and its family are noble metals, the negative electrode of McElroy '595 contains a non-trace amount of noble metal. McElroy

'595 does not anticipate claim 36 because the negative electrode of McElroy '595 contains a non-trace amount of platinum or platinum family metals.

#### IV. Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date

6/8/06

By



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